PROPAGATED ELECTRICAL IMPULSES IN A SPONGE. *Memoirs of the Queensland Museum 44: 342. 1999*:- Previous work has shown that *Rhabdocalyptus dawsoni*, a hexactinellid sponge, can arrest its feeding current following mechanical or electrical stimuli. Although a propagated impulse was suspected as the signal triggering arrests, numerous attempts to record such an event failed due to the porous character of the tissue and extreme fragility of the surface membranes. Using a new approach, which involves dissociating sponge tissue, letting it reaggregate, and grafting it back on to the sponge as an autograft, we have found it possible to record propagated electrical impulses. The grafts fuse with the trabecular reticulum, a syncytial tissue that penetrates all parts of the body, including the flagellated chambers, and are eventually absorbed into the sponge. But for a while they form solid lumps that can be used for attachment of suction recording electrodes. Impulses are all-or-none events evoked by single electrical shocks that propagate diffusely through the entire preparation at 0.27 ± 0.1cm·s^{-1} at 10°C, presumably in the trabecular reticulum. The preparation shows an absolute refractory period of 29 s, and is relatively refractory for a further 95-100 s. Intracellular recordings have not been carried out but the wave form recorded extracellularly is suggestive of a conventional, overshooting spike. Pharmacological evidence suggests that it is calcium-based. Thus, despite its long refractory period and low conduction velocity the system is functionally equivalent to the through-conducting nerve nets and excitable epithelial conduction systems of other animals. ❐ *Porifera, hexactinellid, Rhabdocalyptus, conduction, electrophysiology, behaviour, pumping.*

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THEONELLAPEPTOLIDES FROM THE DEEP-WATER NEW ZEALAND SPONGE *LAMELLOMORPHA STRONGYLATA*. *Memoirs of the Queensland Museum 44: 342. 1999*:- The deep-water marine sponge, *Lamellomorpha strongylata*, was collected by benthic dredging at 80m on the Chatham Rise (200km off the E Coast of the South Island of New Zealand). Besides the previously reported calyculins, calyculinamides and swinholide H, five new tridecapeptides, theonellapeptolides IIIa, b, c, d and e, were obtained (Fig. 1).

The following strategy was used for determining the structures of the theonellapeptolides: 1) the amino acids were established by GC/MS following acid hydrolysis and derivatization; 2) methanolysis gave a linear peptide, which was sequenced by tandem mass spectrometry; 3) isobaric residues were distinguished by 2D NMR experiments; 4) detailed analysis led to the complete NMR assignment; 5) the absolute stereochemistry of IIIe was determined by X-ray crystallography coupled with chiral HPLC; 6) the stereochemistry of the other peptides were established by an LC/MS method.

Theonellapeptolides IIIb, c, d and e showed mild cytotoxicity against P388 cell line, but IIIa was very much less cytotoxic. This implied that the second residue from N-terminus (X) plays a key role in maintaining bioactivity.

A comparison with the known theonellapeptolide Id suggested that the crystal structure of IIIe is similar to that of Id although four residues are changed and the ring size is 36 in IIIe, not 37 as in Id.

The theonellapeptolides from the I and II series have all been isolated previously from Lithistid sponges, while those from the III group are nominally from a different sponge order. A key question still to be adressed is whether or not all three groups of peptolides have a similar, or comparable, symbiont origin ? ❐ *Porifera, peptolides, amino acids, nmr spectroscopy, lc/ms, gc/ms, chiral hplc, X-ray crystallography, symbionts, Lithistida, Theonella sp., Lamellomorpha strongylata, New Zealand.*

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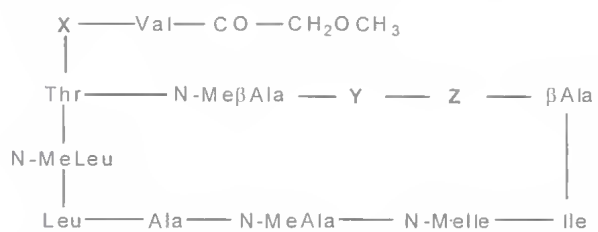

Theonellapeptolides IIIa to e:

(a)	X=N-MeHyMet,	Y=Val,	Z=N-MeIle
(b)	X=N-MeAla,	Y=Val,	Z=N-MeIle
(c)	X=Leu,	Y=N-MeAla,	Z=N-MeIle
(d)	X=N-MeLeu,	Y=Val,	Z=N-MeVal
(e)	X=N-MeLeu,	Y=Val,	Z=N-MeIle

FIG. 1. Structures of theonellapeptolides from *Lamellomorpha strongylata*.